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7 September 2011

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SOLANO COUNTY TAXPAYERS ASSOCIATION; INFORMATION REQUEST REGARDING BASIS FOR TRIHALOMETHANES AND NITRATE EFFLUENT LIMITS FOR CITY OF VACAVILLE EASTERLY WASTEWATER TREATMENT PLANT

Thank you for your letters dated 25 February 2011 to the Central Valley Regional Water Quality Control Board (Central Valley Water Board) and 5 May 2011 to Heidi Bethel of the United States Environmental Protection Agency (USEPA). Your letters request information regarding the regulation of the City of Vacaville Easterly Wastewater Treatment Plant, specifically the basis for regulating trihalomethanes and nitrate in the wastewater treatment plant discharge. Your second letter expresses frustration in obtaining satisfactory answers. We apologize if you feel that we have not been responsive to your request. It was not our intention to put you through what you term the "bureaucratic run around." When my staff referred you to staff of the USEPA it was to assist you to get the desired information regarding cost and risk analysis, and scientific basis of the federally established criteria.

Your questions regarding the process by which the California Toxics Rule (CTR) criteria for trihalomethanes were developed can be best answered by the experts at USEPA. We understand that USEPA staff have been assisting you and providing the information you have requested regarding trihalomethanes. This letter provides information regarding your request for nitrate, as well as information regarding the basis of the NPDES permit requirements and the Central Valley Water Board efforts to work cooperatively with the City regarding compliance with effluent limitations for trihalomethanes and nitrate.

The Water Boards issue permits to protect beneficial uses of surface and ground waters. The uses being protected vary with the waterbodies involved, so the permits are customized for each discharge. The beneficial use impacted by the discharge of trihalomethanes and nitrate is the municipal and domestic water supply use, also referred to as MUN use. On a site-specific basis, we consider dilution when evaluating the impact on the waterbodies to provide regulatory relief. The City of Vacaville discharges into channels that have little or no dilution, which means that the corresponding NPDES permit contains very stringent effluent limits. The Central Valley Water Board has, however, made site-specific decisions to protect beneficial

uses at an appropriate level, which has resulted in less-stringent discharge requirements for the City.

The City's treated wastewater discharge enters Old Alamo Creek, an ephemeral stream which has almost no other flow other than storm water runoff. It has been determined that Old Alamo Creek is not a drinking water supply and the Central Valley Water Board's Water Quality Control Plan for the Sacramento-San Joaquin River Basin (Basin Plan) was amended to remove drinking water as a beneficial use of Old Alamo Creek. This determination was based on technical studies and approved by the Central Valley Water Board, the State Water Board, the Office of Administrative Law (OAL), and the USEPA. Therefore, the City does not have to treat its wastewater to protect Old Alamo Creek for drinking water.

Old Alamo Creek flows into New Alamo Creek. Initially it was believed that the changes of beneficial uses for Old Alamo Creek would resolve the City's compliance problems for trihalomethanes and nitrate, but subsequent water quality monitoring showed this was not true. Subsequent studies of uses of New Alamo Creek were conducted, concluding that the drinking water use would need to be removed from parts of New Alamo Creek, Ulatis Creek and the Delta to completely remove some of the effluent limits in which the City is not able to comply. It was judged that removal of the drinking water use from all these waterbodies was not legally justified. Therefore, effluent limitations for trihalomethanes and nitrate are included in the City's 2008 NPDES permit, with which the City cannot currently comply.

Trihalomethanes

With regard to trihalomethanes, the City's 2008 NPDES permit includes effluent limitations for trihalomethanes[1], chlorodibromomethane and dichlorobromomethane, which are necessary to protect the MUN beneficial use of the downstream waterbodies. Chlorodibromomethane and dichlorobromomethane are California Toxics Rule (CTR) priority pollutants with human-health based criteria established by the USEPA. The State Water Resources Control Board's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California requires that NPDES dischargers comply with all CTR criteria by 18 May 2010. The City is currently under a Time Schedule Order to comply with the trihalomethanes effluent limits by 1 April 2015.

As part of its method of compliance, the City conducted a use attainability analysis (UAA) for the downstream receiving waters. The UAA determined that it is reasonable to assume that there is very limited drinking water use in New Alamo Creek and Ulatis Creek; therefore the City chose to pursue a Basin Plan amendment to establish less stringent site-specific water quality objectives for trihalomethanes that would be applicable to these segments of receiving water downstream of the discharge. Central Valley Water Board basin planning staff worked with the City to develop site-specific objectives for trihalomethanes, which were approved by the Central Valley Water Board through a Basin Plan amendment adopted on 27 May 2010. The State Water Board approved the site-specific objectives on 16 August 2011. The final step for implementation of the site-specific objectives is approval by the Office of

[1] Trihalomethanes are a group of chemicals formed as a by-product when wastewater is disinfected with chlorine to kill pathogens.

Administrative Law (OAL) and USEPA. Their review is expected to begin next month. Implementation of the site-specific objectives would result in the removal of the effluent limitations for chlorodibromomethane and dichlorobromomethane, thus resolving the compliance issue for trihalomethanes. No additional treatment would be required by the City.

Nitrate

As discussed above, the downstream waters of the City's discharge have limited long-term drinking water use, so less stringent site-specific objectives have been adopted for trihalomethanes, which are carcinogens. For carcinogens, the impacts to humans are considered over long exposure periods (e.g., 70 years). Therefore, for this area it was determined to be appropriate to relax the objectives for the protection of human health. Nitrate, however, is not a carcinogen, and is known to cause adverse health effects in humans at significantly shorter exposure periods. The California Department of Public Health (DPH) and USEPA developed a maximum contaminant level (MCL) for nitrate of 10 milligrams per liter (mg/L) measured as nitrogen (N) for the protection of human health. MCLs are drinking water standards adopted by the DPH pursuant to the California Safe Drinking Water Act, and USEPA in accordance with the Federal Safe Drinking Water Act. All MCLs have been incorporated in the Basin Plan and are applicable to surface waters that have designated beneficial use of MUN. The City's 2008 NPDES permit includes final effluent limitations for nitrate based on the California and Federal MCLs, which is necessary to protect the MUN beneficial use of the downstream surface waters.

Threshold toxicity levels (e.g., reference dose) are used by DPH in calculating the MCLs for non-carcinogens, such as nitrate. A reference dose is an estimate of the daily exposure to the human population that is likely to be without appreciable risk of toxic injury or disease. For nitrate, the reference does is 11 mg/L (as N), which is very close to the MCL of 10 mg/L (as N). Exposure to nitrates at levels greater than the reference dose increases the probability of adverse effects, particularly for infants less than six months of age and also affects the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies.

Compliance with nitrate effluent limitations has been an issue for the City for the past decade. A nitrate effluent limitation was originally included in the City's 2001 NPDES permit in which compliance was required by 1 March 2008. During the NPDES renewal process for the current 2008 NPDES permit, the City provided the Central Valley Water Board office with documentation of dilution in New Alamo Creek, and requested a new less-stringent effluent limitation for nitrate that considered the identified dilution. The Central Valley Water Board approved the dilution study and adopted a new, less stringent nitrate effluent limitation of 17 mg/L (Nitrate as N) based on available dilution. However, the City was still unable to meet the new nitrate effluent limitation; therefore, the Central Valley Water Board adopted an accompanying Time Schedule Order providing a 5-year time schedule for the City to comply with the nitrate limitation. The new nitrate effluent limitation and 5-year compliance schedule are in accordance with state and federal laws and the Basin Plan. The City is currently constructing a Tertiary Upgrade project to meet the final effluent limits for nitrate. Based on the City's July 2011 Capital Improvement Projects Status Report, the estimated costs for the

nitrate removal improvements is $4,010,000. The upgrades are scheduled to be completed in time to meet the final compliance date of 1 May 2013.

All NPDES dischargers that discharge to surface waters where the municipal and domestic water supply beneficial use is applicable must comply with the MCL for nitrate to protect public health. The most common method to remove nitrate is through a biological treatment processes referred to as "nitrification/denitrification" or NDN. The predominant form of nitrogen in municipal domestic wastewater is ammonia. The NDN process uses the natural nitrogen process to convert ammonia to nitrite, then to nitrate, and finally to nitrogen gas, which is released to the atmosphere. Several municipal NPDES dischargers in the Delta utilize the NDN process to reduce ammonia and nitrate in their discharges, including the Cities of Tracy, Manteca, Lodi, and Rio Vista, and the Mountain House Community Services District.

We understand facility upgrades to address these issues can be costly. As discussed above, the requirements for nitrate in the 2008 NPDES permit are necessary to comply with state and federal laws and regulations. The Central Valley Water Board does not have discretion to provide additional regulatory relief.

If you have any further questions or need additional information regarding the permitting of this discharge, please contact Jim Marshall at (916) 464-4772 or jdmarshall@waterboards.ca.gov. If you have any further questions regarding site-specific criteria and the scientific basis of the criteria, please contact Betty Yee at (916) 464-4643 or byee@waterboards.ca.gov.

Original Signed By

Pamela C. Creedon
Executive Officer

cc: Heidi Bethel, Ph.D., USEPA Office of Water, Washington D.C.
Matthew Mitchell, USEPA Region 9, San Francisco